

April 17, 2014

TO: Montana Natural Resource Damage Program

FROM: Trout Unlimited

RE: Summary of NRDP-FWP-TU 2013 Fish Passage Assessment Review and Project Prioritization for Select Upper Clark Fork Tributaries, 1/8/2014

Attendees: Doug Martin - NRPD, Casey Hackathorn - TU; and Pat Saffel, Brad Liermann, and Jason Lindstrom - FWP

Trout Unlimited (TU), under contract with the Montana Natural Resource Damage Program (NRDP) conducted fish passage assessment surveys of Blacktail Creek, Browns Gulch, Little Blackfoot River, Snowshoe Creek, Spotted Dog Creek, Dog Creek, Flint Creek and Boulder Creek in the summer of 2013. TU had previously conducted fish passage assessment work in multiple Upper Clark Fork tributaries from 2010-2012 under separate funding. TU compiled all available data, evaluated fish passage for all structures surveyed, and built maps of each watershed including locations of all structures identified. TU provided the survey data, evaluations, and maps to NRDP and Montana Fish, Wildlife and Parks (FWP) for review in late 2013. Representatives from TU, NRDP, and FWP met in January 2014 to review findings and identify future priority fish passage project. The following is a summary of the discussion and priority projects selected for implementation beginning in 2014.

Blacktail Creek

Fish Passage Assessment Summary

Of the 13 water right points of diversion (PODs) we investigated on Blacktail Creek, only two structures appear to impair upstream passage of adult salmonids (Redfern and Sunset North Subdivision) and a third likely impacts upstream passage of juvenile salmonids and other species with poor jumping performance (Butte Country Club) but would pass adult trout under most conditions. The Redfern Diversion is also the only diversion on Blacktail Creek determined to pose an entrainment risk when in use.

Five of the 21 culverts surveyed on Blacktail Creek were modeled to prevent fish passage of both adult and juvenile salmonids. Of these five, four are found upstream of the Beaverhead-Deer Lodge National Forest and one (Continental Drive) is found on private property. Five additional culverts above the National Forest boundary were modeled to prevent juvenile salmonid passage under all flow conditions and prevent adult passage under some flow conditions. Eight additional culverts surveyed on private property downstream into Butte were modeled to restrict fish passage under some conditions but appear to provide for passage of adult salmonids during most of the flow conditions on Blacktail Creek.

Genetically pure WCT inhabit the upper reaches of Blacktail Creek while brook trout dominate the lower reaches into Butte. Blacktail Creek has the potential to provide an additional source of recruitment of

WCT to Silver Bow Creek. Improving fish passage on Blacktail Creek has the potential to restore a migratory population of WCT in Blacktail Creek.

Priority Fish Passage Projects

1. Improve or Replace Redfern Diversion. Work with landowners to improve diversion structure to allow for upstream fish passage and reduce entrainment or consider water right transaction and diversion removal. The current structure backwaters the upstream culvert under Continental Drive. Any solution should incorporate an evaluation of impacts on fish passage at the culvert and determine if additional action needs to be taken to mitigate them.
2. Remove or modify historic diversion structure upstream of Butte Country Club (Sunset North Subdivision). Work with current landowner (and historic irrigator if necessary) to modify or remove structure to allow for fish passage and improve stream function.

Future Considerations

- Consider removing or modifying the chain link fence immediately upstream of the I-90 culverts to prevent backwatering from debris jams and potentially improve fish passage for large adults.
- Consider working with the Butte Country Club to separate the on-stream irrigation pond from Blacktail Creek. This project could conceivably be incorporated into other habitat improvement project work on the Country Club property.
- Coordinate with Beaverhead-Deerlodge National Forest on planned restoration activities impacting the Blacktail Creek fishery and engage on potential for culvert replacement projects on the Forest. NRDP funds can be used for the private road culverts as USFS is working on culverts on FS property.

Browns Gulch

Fish Passage Summary

Of the 13 active diversions on Browns Gulch all but one appear capable of impairing fish passage under some conditions and 4 are likely barriers to upstream passage as they are currently being used. Of the 15 road crossings surveyed on Browns Gulch two were modeled as complete barriers. Both are located on the upper reaches above the Beaverhead Deer Lodge National Forest boundary. Several others are modeled as likely barriers to juvenile salmonids and impair passage of adults under certain flow conditions.

Little is known about migratory fish behavior in Browns Gulch. Upper tributaries maintain resident populations of WCT while brook trout dominate the mainstem. Fluvial Silver Bow Creek WCT have been observed utilizing lower Browns Gulch on occasion. Fish populations in Browns Gulch appear to be limited by habitat and flow impairments. It is unclear at this point if improvements to fish passage have

the potential to restore a migratory component to the WCT population in the Browns Gulch watershed without significant changes to land and water management as well.

Based on the current data, FWP recommends prioritizing fish passage improvements in the upper reaches of Browns Gulch (above Hail Columbia Gulch) to provide for seasonal fish movements in the upper watershed and protection of remnant WCT populations in tributaries. If in the future, fluvial WCT are found to move from Silver Bow Creek up Browns Gulch to known barriers in an attempt to migrate upstream, additional effort could be prioritized to improve fish passage on lower Browns Gulch as well.

Priority Fish Passage Projects

1. Improve fish passage and reduce entrainment upstream of Hail Columbia Gulch. Engage private landowners to seek cost effective cooperative solutions for improved fish passage and reduced entrainment at irrigation diversions on upper Browns Gulch. Engage public and private partners to seek replacement of road crossings that impair fish passage in the upper reaches of Browns Gulch (one culvert on public land and one culvert on private road currently are identified as priorities in this reach).
2. Monitor for fluvial WCT on lower reach during spring migration period. FWP has agreed to monitor fish movement at the first know barrier on Browns Gulch during spring of 2014.

Future Considerations

Reassess biological data and improvements to habitat and connectivity annually to determine future restoration activities on Browns Gulch.

Warm Springs Creek

Fish Passage Summary

TU surveyed diversion structures on Warm Springs Creek in 2011 including two irrigation diversions, one diversion for fish and wildlife habitat, and one industrial diversion. The two irrigations diversion both pose significant entrainment risk to migratory fish. The Gardiner Ditch Diversion, located downstream of Anaconda near the Galen Rd bridge, also has the potential to impair upstream fish passage under some conditions. FWP maintains a diversion for the Warm Springs WMA ponds on the lower reach of Warm Springs Creek that poses a limited risk of entrainment but has no structure in the stream channel and does not impact upstream fish passage. The industrial diversion, Myers Dam, is maintained by Butte-Silver Bow for industrial purposes and is a complete barrier to upstream fish passage in all but extreme high flow conditions. In addition, the Butte-Silver Bow government maintains diversion structures on Twin Lakes and Storm Lake Creeks that limit upstream fish passage.

Road crossings on Warm Springs Creek and priority tributaries have not been evaluated for fish passage under the NRD program. Some past survey data may be available from the Forest Service.

Warm Springs Creek and several tributaries are designated as Critical Habitat for bull trout by the USFWS. In addition, Warm Springs Creek provides an important recreational fishery, is a significant source of trout recruitment to the Clark Fork River at its headwaters, and provides a cold water refuge for Clark Fork fish during periods of high water temperatures on the mainstem. Improving fish passage and reducing entrainment on Warm Springs Creek from its headwater tributaries to the Clark Fork is a priority for improving both native and non-native sport fisheries.

Priority Projects

1. Assess fish passage at road crossings on priority tributaries. Review any existing data and assess fish passage at road crossings as necessary.
2. Improve upstream fish passage and reduce entrainment at the Gardiner Ditch Diversion. Work with irrigators to develop and implement a cooperative diversion improvement and screening project.
3. Reduce entrainment at the private irrigation diversion located upstream of Myers Dam. Work with irrigators to develop and implement a cooperative screening project.
4. Work with Butte-Silver Bow City-County government to develop and implement a selective fish passage improvement project at Myers Dam on Warm Springs Creek and at the Silver Lake diversions on Twin Lakes and Storm Lake Creeks.

Future Considerations

Developing and implementing long-term monitoring and management programs for selective passage structures will be necessary for the long-term success of fish passage investment in the watershed. In addition, development and implementation of a long-term maintenance program for screening projects throughout the Clark Fork basin will be necessary to ensure the long range success of screening projects.

Little Blackfoot River

Fish Passage Summary

TU identified 33 irrigation diversions on the Little Blackfoot River. We secured access and surveyed 18 of the diversions. In general, most of the diversions appear to have little impact on upstream fish passage. A few may impair upstream passage of juvenile trout during some conditions. All diversions surveyed pose some risk to entrainment when in use. Many Little Blackfoot irrigators maintain push-up dams and annually maintain instream structures impacting stream habitat.

All road crossings on the Little Blackfoot River were found to be bridges and do not appear to impact fish passage. The uppermost road crossing on Ontario Creek Road includes a bridge and two culverts on side channels. The road prism dams the floodplain at this location is likely a failure risk. The Helena National Forest is in the planning stages of relocating this stream crossing to a more appropriate location.

Priority Fish Passage Projects

It will be difficult to effectively prioritize fish passage improvement projects on the mainstem Little Blackfoot until additional assessment work can be completed on the remaining irrigation diversions. At this time, the group agreed to table fish passage project prioritization until additional access and or data becomes available.

Future Considerations

Habitat assessment work will be conducted in the watershed in 2014 although access on the mainstem Little Blackfoot River is very limited to date. Entrainment appears to be the largest impact from irrigation infrastructure on fish in the Little Blackfoot. Some future consideration should be given to assessing priorities for potential screening projects on the Little Blackfoot.

Dog Creek

Fish Passage Summary

We investigated four PODs on Dog Creek. The upper two on the Sieben Ranch are now longer in use. We have been unsuccessful to date at gaining access to further investigate the lower two. We identified and surveyed four culverts at road crossings in the upper reaches of Dog Creek: two were modeled to prevent fish passage of adult and juvenile salmonids, one that was modeled to prevent upstream passage of juveniles and one that resembled the natural stream channel. Due to the limited habitat available upstream of the problem culverts, they are not considered a priority for project work at this time.

Priority Fish Passage Projects

None identified at this time.

Future Considerations

Continue to seek access to lower Dog Creek property and assess fish passage at the remaining diversions. Reassess project potential if new data becomes available.

Spotted Dog Creek

Fish Passage Summary

We surveyed five irrigation diversions and one on-stream reservoir dam for fish passage on Spotted Dog Creek all managed by the Spotted Dog Ranch. We determined the reservoir dam to be a complete barrier to upstream fish passage. The remaining irrigation diversions (pin and plank style diversions set on a poured concrete aprons) are all likely capable of preventing upstream passage under some conditions when checked up to divert water. In addition, the dams appear to be causing ponding and aggrading conditions upstream degrading stream habitat conditions.

Priority Fish Passage Projects

Due to the interconnected habitat and passage issues on Spotted Dog Creek, the group consensus is to complete the riparian assessment and work the irrigator and landowners to develop a solution that addresses both. The landowner has expressed interest in participating in restoration activities and should be engaged and kept informed through the process.

Future Considerations

Coordinate with riparian assessment project managers to ensure that habitat impacts of irrigation structures are documented.

Snowshoe Creek

Fish Passage Summary

We gained access to survey 4 of 9 identified diversion structures on Snowshoe Creek. Of the four surveyed, one appears to have potentially significant impact on upstream fish passage, two are temporary and potentially impact passage seasonally, and one has no impact on upstream passage. All four likely entrain fish when in use. In addition to the irrigation diversions there is an on-stream reservoir dam (Lois Lake) that was not assessed for fish passage due to lack of access. Visual observation from a public road suggests that an earthen spillway may provide for a fishway when water is spilled over the dam but survey work will be necessary to make an informed assessment.

We found and surveyed one road crossing with a culvert on Snowshoe Creek and found it to model as a partial fish passage barrier. It appears to provide for upstream passage of adult salmonids through most flow conditions although it likely impairs upstream passage of juveniles under some conditions.

Priority Fish Passage Projects

Due to incomplete data fish passage project prioritization was tabled on Snowshoe Creek. Continue to seek access, complete assessment work as possible, and complete project prioritization.

Future Considerations

One landowner made contact this winter and offered access for assessment this summer. Some effort should be made to coordinate with riparian assessment project managers prior to field season if access is gained to the remaining two properties with known structures on Snowshoe Creek.

Flint Creek

Fish Passage Summary

We identified 43 diversions and one concrete weir on Flint Creek and were successful in gaining access to survey all but 10 of them. Of the structures surveyed, three appeared likely to prevent upstream fish passage to all fish during part of the irrigation season and another three that are likely to pose a barrier under some conditions. All diversions surveyed pose some entrainment risk when in use. With assistance from FWP we conducted entrainment surveys on 22 diversion ditches documenting

entrainment in 21 of them. The review group agreed that the first priority reach for implementing fish passage and screening projects on Flint Creek should be from the mouth of Boulder Creek to the Clark Fork River to reconnect habitat for migratory bull trout. Additionally the largest diversions (by water diverted) should be considered first for screening projects due to their likely proportional entrainment impact.

We surveyed six culverts on Flint Creek. The uppermost culvert located on Powerhouse Rd below Georgetown Lake was the only one that modeled as a complete barrier. The remaining structures appear to allow for adult passage while preventing upstream passage of juveniles under most flow conditions.

Priority Fish Passage Projects

1. Allendale Ditch Diversion. Work with DNRC, Flint Creek Water Users and landowners to develop a project to reduce entrainment and improve upstream fish passage at the largest diversion on Flint Creek. Work with water users to consider incorporating the two diversions immediately downstream into the project.
2. Buck Ranch Diversion in Hall. Work with landowner and irrigators to develop and implement a diversion replacement or improvement and screening project to allow for year-round upstream fish passage and reduce entrainment in two irrigation ditches.

Future Considerations

Complete additional assessment activities if access is made available. Consider developing and implementing a monitoring plan to assess future impacts of restoration activities. Consider developing a long-term maintenance plan for fish screens installed in the watershed.

Boulder Creek

Fish Passage Summary

We investigated seven Boulder Creek PODs. Four were found to be in disrepair are not currently in use. Of the three in use, one is very small and poses a small entrainment risk but does not appear to impact upstream passage. The two remaining structures pose significant entrainment risks due to the quantity of water they divert. The review group agreed that diversions on Boulder Creek are a priority for fish screening to prevent entrainment loss of migratory bull trout. All road crossings on Flint Creek were found to be bridges and do not impact fish passage.

Priority Projects

1. Morrison Diversion. Work with the landowner and irrigator to develop and implement a cooperative fish screen project and diversion improvement if necessary.
2. Boomer and Buxbaum Diversion. Work with the landowner and irrigator to develop and implement a cooperative fish screen project and diversion improvement if necessary.

Future Considerations

We recently found reference to an additional Morrison diversion near the mouth of Boulder Creek that we were not aware of during our survey. Investigate if it's still in use and complete assessment work if necessary. Consider developing and implementing a monitoring plan to assess future impacts of restoration activities. Consider developing a long-term maintenance plan for fish screens installed in the watershed.